



US006261737B1

(12) **United States Patent**
Fujita et al.

(10) **Patent No.:** US 6,261,737 B1
(45) **Date of Patent:** Jul. 17, 2001

(54) **POLYMETHINE COMPOUNDS, METHOD OF PRODUCING SAME, AND USE THEREOF**

(75) **Inventors:** Shigeo Fujita, Osaka; Nobuaki Sasaki, Kyoto; Yasuhisa Iwasaki, Nara, all of (JP)

(73) **Assignee:** Yamamoto Chemicals, Inc., Osaka (JP)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/447,257

(22) **Filed:** Nov. 23, 1999

(30) **Foreign Application Priority Data**

Nov. 30, 1998 (JP) 10-356927

(51) **Int. Cl.⁷** G03C 1/72; G03F 7/004

(52) **U.S. Cl.** 430/270.1; 430/302; 430/944; 430/945; 101/453; 101/467; 8/659; 8/690

(58) **Field of Search** 430/270.1, 302, 430/944, 945; 101/453, 467; 8/659, 690

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,871,656 * 10/1989 Parton et al. 430/522

FOREIGN PATENT DOCUMENTS

0387357-A1 * 9/1990 (EP) C07D/209/70

0438123-A2 * 7/1991 (EP) C08F/2/46

1006116-A1 * 6/2000 (EP) C07D/491/056

* cited by examiner

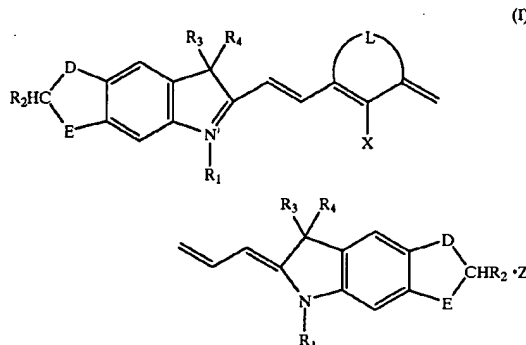
Primary Examiner—Hoa Van Le

Assistant Examiner—Barbara Gilmore

(74) *Attorney, Agent, or Firm*—Birch, Stewart, Kolasch & Birch, LLP

(57) **ABSTRACT**

The invention provides near infrared absorbers showing high light-to-heat conversion efficiency and high sensitivity to laser beams whose emission region is within the range of 750 nm to 900 nm, plates for direct printing plate making, and novel compounds which can be used in such absorbers or plates. The compounds are polymethine compounds of the general formula (I) shown below and the near infrared absorbers comprise the polymethine compounds.



In the formula, R_1 represents an alkyl group, which may optionally be substituted, R_2 represents a hydrogen atom or a lower alkyl group, R_3 and R_4 each independently represents a lower alkyl group or R_3 and R_4 may combinedly form a cyclic structure, L is an alkylene group which is required for the formation of a cyclic structure and may optionally be substituted, one or more carbon atoms of which cyclic structure may be replaced by some other atom(s) or atomic group(s), D and E each independently represents an oxygen atom or a methylene group, X represents a hydrogen or halogen atom or a substituted amino group, and Z represents a charge-neutralizing ion.

10 Claims, 7 Drawing Sheets

